

Progress Report - October 29, 1987

Fish Management Plan - Crooked River (Prineville Dam to city of Prineville).

- Management plan adopted by the Commission 1979
- Management objectives are being met. Two changes have been made, however:
 2. Random creel sampling continues, but fish food production has not been measured.
 3. We have deleted this objective. The trout population appears to be a function of the amount and duration of spill from Prineville Reservoir in the spring and the amount of water left in the stream after the irrigation season.

1979
adopted

FISH MANAGEMENT PLAN

CROOKED RIVER
(Prineville Dam to City of Prineville)

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Division
August 1979

CROOKED RIVER ^{1/} FISH MANAGEMENT PLAN

INTRODUCTION

The Crooked River is a major tributary to the Deschutes River and has the habitat to produce a good rainbow trout population, especially between Prineville Dam (RM 73) and Rice-Baldwin Dam (RM 59) (Fig. 1). However, winter streamflow is minimal and high turbidity is common.

The river is not stocked but various ages and sizes of hatchery fish emigrate from Prineville Reservoir during periods of spill; and these fish constitute a sizable portion of the trout population in the river. The Crooked River has maintained a successful fishery on the combination of wild and hatchery (from Prineville Reservoir) trout under general statewide regulations.

In July 1979, the Oregon Fish and Wildlife Commission accepted the Department's recommendation to continue to manage this portion of Crooked River for wild and hatchery fish. Hatchery fish will not be stocked in this section of the river, but large numbers of hatchery trout migrate from Prineville Reservoir into the river below the dam.

HABITAT

The Crooked River below Prineville Dam is essentially an artificial stream. Flow is highly variable and depends on water releases from Prineville Reservoir. Winter releases from the reservoir are often low and streamflow therefore is low. This limits the ability of the stream to support trout during the winter months.

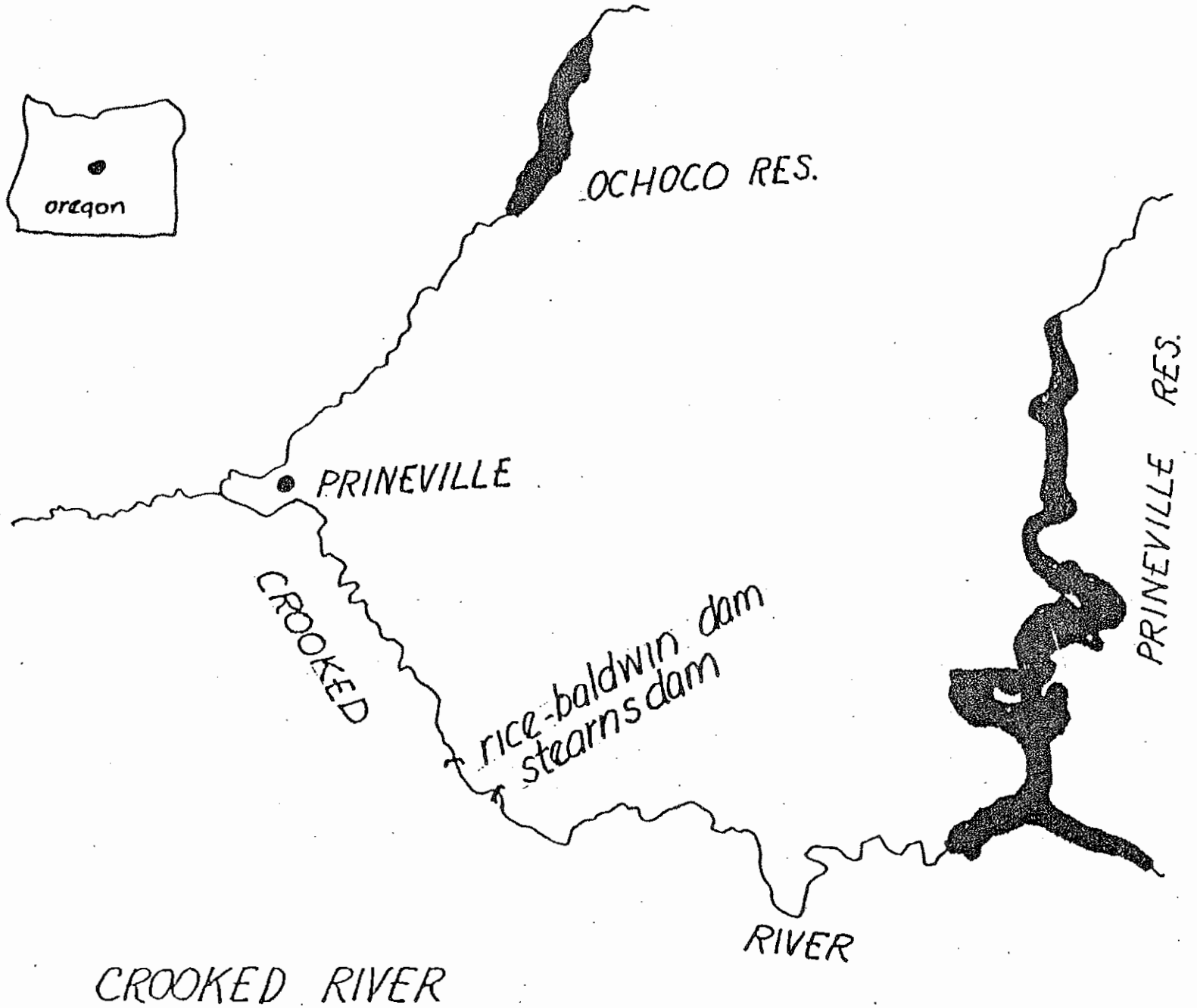
Stream productivity, as measured by conductivity readings, has not been adequately determined but is relatively high as growth of fish is good. Stream gradient is gradual (8 feet per mile) and the 23-mile section averages 35 feet in width. Water temperatures average 50 F throughout the summer (April-September). In-stream aquatic vegetation is dense in some areas, while streamside vegetation is only fair and provides limited cover. Rice-Baldwin Dam is a barrier to upstream fish movement. Spawning gravel appears to be adequate.

High turbidity has been a major problem in the Crooked River since 1969. This has restricted aquatic plant growth, fish food production and ultimately growth of trout. This contrasts with pre-1969 conditions when water quality and trout growth were better. Colloidal clays remain in suspension in Prineville Reservoir and often contribute severe discoloration to the river throughout the fishing season.

A study conducted by Oregon State University (OSU) in the early 1970's indicated that watershed changes resulting from certain livestock grazing,

^{1/} From Prineville Dam (RM 73) downstream to the City of Prineville (RM 50).

Fig. 1. Crooked River from Prineville Dam to the City of Prineville



timber harvest, road building, and fire prevention practices contributed to erosion and long-term turbidity problems. The OSU study included recommendations for management practices that would aid in stabilizing the watershed. Some of these practices are being instituted, but it will take many years to significantly reduce turbidity in the river.

FISH POPULATIONS

Rainbow trout are found throughout the entire section. Except for 1973, no hatchery fish have been released in the river since 1970. However, mark analysis since 1967 shows as high as 50+% of the trout catch in the river resulted from fingerling releases in Prineville Reservoir. Smallmouth bass, suckers, chiselmouth, dace, brown bullheads, and some cutthroat are also present and compete with rainbow for food, shelter, and living space. These species also spill out of the reservoir into the river below. Relative fish population data were obtained from 1972 through 1975 and in 1979.

Trout growth was good 9 years ago when marked fish stocked at a length of 4 inches in June 1970 averaged 6.8 inches in August 1970, 9.8 inches in April 1971, and 10.5 inches in August 1971. Rainbow trout had little competition at that time from other species of fish. Size and age at maturity has not been determined but is probably 12 inches and 3 years.

FISHERY

Public access is good. A highway parallels the upper river, and one large campground is located at RM 69.5.

Angler use is heavy. A statistical creel program in 1972 revealed 16,950 anglers fished 96,000 hours to catch 42,500 trout for an average catch rate of 0.4 fish per hour. Random creel sampling the past 5 years has shown an average catch rate of 0.5 trout per hour with 85% of the trout less than 12 inches in length.

An angler preference survey was conducted on the river in 1974 when 234 anglers were interviewed between April 27 and September 15. The survey found that 68% of the anglers travelled more than 50 miles to the river, 87% opposed a flies and lures only regulation, 65% opposed reduction of the bag limit, 92% opposed a bag limit of 2 trout over 12 inches, and 95% opposed a catch and release regulation.

DISCUSSION

The Crooked River produced larger trout in the past than now, but it did so with less turbidity, fewer nontrout competitors, more aquatic vegetation, and more productive water from Prineville Reservoir as a new impoundment. We believe the river is still capable of producing trout larger than are presently seen in the creel, but we are not sure if this can be accomplished. The trout population varies considerably annually depending upon the amount

and duration of spill from Prineville Reservoir and the degree of reduction of streamflow each fall at the end of the irrigation season. For example in 1978 only 15% of the trout caught were over 12 inches long, while in a similar period in 1979 29% exceeded this length. These differences may partly be attributed to low winter flows in 1977-78 and high flows in 1978-79.

There are several potential methods of increasing the size of trout in the river. However, each method has its limitations and none may guarantee additional large trout.

The general statewide daily bag limit applies to Crooked River. Prior to 1980 this was 10 fish per day over 6 inches in length. The daily bag was reduced to 5 fish over 6 inches in 1980. The effect of this reduction on Crooked River catch should be determined; it may tend to increase age and size of fish in the creel. A significant reduction in the bag limit could reduce the total catch if angling effort remained unchanged. This might provide a larger carry-over population and more large fish the following year if streamflows remained high enough to support the numbers.

Increasing the minimum length above 6 inches might increase the overall size composition of the population since the length limit determines the size at which a year class is first cropped. However, this would not prevent smaller fish from being caught, and some mortality would occur after release. Regulations to harvest fewer large trout or more small trout might also increase size of fish. Catch and release of large trout could be encouraged and chemical treatment of river segments to reduce competition with other species might be considered.

A later opening of the fishing season has limited application because few spawning or spent fish are seen in the spring creel. Zero-age juvenile fish are collected in fall sampling, indicating trout successfully spawn in the spring. In those years when the irrigation season ends prior to October 31, river flows are drastically reduced and trout are more vulnerable to angling until the fishing season ends. An earlier fishing closing, therefore, could protect some trout.

Restrictive terminal tackle regulations would minimize loss of trout that are caught and released. However, this would unduly restrict the catch of hatchery trout that moved to the river from Prineville Reservoir.

In summary, the Crooked River is a highly artificial stream subject to extreme variations in flow and fish populations due to the operation of Prineville Reservoir. Because of this, Department biologists do not believe it can be considered a wild trout stream. The Crooked River now has physical and biological characteristics much different than those present in the first few years of reservoir operation. Department biologists do not believe the river is capable of producing the unusually large trout found in earlier years. While it might be possible to increase the number of large trout present, the use of unusually restrictive regulations for this purpose is suspect since they would adversely impact the existing high use in an obviously successful trout fishery.

OBJECTIVES

1. Improve habitat.
 - a. Continue to support the Bureau of Reclamation request that part of the unassigned space in Prineville Reservoir be used to insure a greater minimum flow below Prineville Dam. The present minimum flow below the dam is 10 cfs. Increased flow in the winter would have the potential to carry over a larger population of trout into the next year.
 - b. Encourage land management practices upstream of the reservoir that would reduce the silt load.
2. Obtain fish population information (species, numbers, size and age distribution, growth rates, condition, size and age at maturity) by electrofishing transects in this section. Also obtain data on catches and fish food production.
3. Maintain and improve the size structure of the rainbow trout population. Consider various management options including regulations and species control through chemical treatment.